

# Radiographic Quality Assurance and Infection Control

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## Quality assurance

The methods used to ensure consistent high quality radiographic processing conditions

## Infection control

The methods used to avoid cross-contamination among patients and operators

### Quality Assurance

- A plan of action is used to ensure radiographs of consistently high quality
- The plan includes assessments of x-ray systems
- Assessments include evaluation of
  - Performance of x-ray machines
  - Manual and automatic processing procedures
  - Image receptors
  - evaluating conditions
  - And keeping records of all test results

### Quality Assurance

#### BOX 7-1 Schedule of Radiographic Quality Assurance Procedures

##### Daily

- Compare radiographs to reference film
- Enter findings in a retake log
- Replenish processing solutions
- Check temperature of processing solutions for proper time-temperature processing
- Make step-wedge test of processing system

##### Weekly

- Replace processing solutions weekly or on alternate weeks
- Clean manual and automatic processing equipment
- Check and clean viewboxes
- Review retake log and implement corrective actions

##### Monthly

- Check darkroom safelight and check for light leaks using penny test
- Check and clean all intensifying screens
- Check that exposure charts are posted by each x-ray machine

##### Yearly

- Calibrate x-ray machine

### Quality Assurance

- *Image receptors*
  - Store in a cool, dry facility away from a radiation source
  - Rotate stock when new film is received
  - Never use films after expiration
  - Monthly cleaning of intensifying screens
  - Check foam supporting the screens

### Quality Assurance

#### ■ *Exposure tables*

- Tables listing the proper kVp, mA and exposure time for making radiographs of each region of oral cavity should be posted by each x-ray machine
- Exposure times are initially determined empirically

## Quality Assurance

X-ray machine: brand name Loconform mA: 15 kVp: 70 E-speed film: brand name		
Projection	Seconds	Exposure time Impulses
Adult periapicals		
Incisors	0.25	15
Premolars	0.30	18
Molars	0.35	21
Occlusal	0.40	24
Adult bitewings		
Premolar	0.30	18
Molar	0.35	21
Edentulous periapicals		
Incisors	0.20	12
Premolars	0.25	15
Molars	0.30	18
Occlusal	0.35	21
Children		
Anterior periapicals	0.25	15
Posterior periapicals	0.25	15
Bitewing	0.25	15
Occlusal	0.30	18

## Quality Assurance

### ■ Manual and automatic film processing

- Deficiencies in this process are the most common cause of faulty radiographs
- Several steps are followed to assure high quality radiographs

### Manual and automatic film processing

1. Replenish solutions daily
2. Check solutions temperature:  
20° for manual processing and 28° for heated automatic processors
3. Clean regularly  
tanks should be cleaned when solutions are changed, rollers should be cleaned weekly
4. Replace solutions regularly  
depending on the rate of use of solutions, size of tanks, whether a cover is used and the T° used

### Manual and automatic film processing

5. Avoid light leaks  
assess the integrity of safelights, check for light leaks around doors and vents. Penny test can be used monthly
6. Reference film
7. Step wedge test

### Manual and automatic film processing



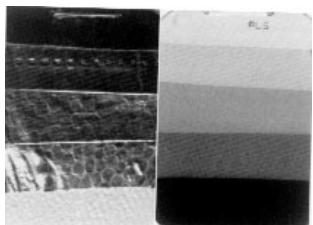
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### *Manual and automatic film processing*



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### **Quality Assurance**

- **X-ray machine tests**
  - X-ray machines are generally quite stable. They need to be calibrated only annually by dental service companies or health physicists
  - The following parameters should be measured:
    1. X-ray output
    2. Collimation and beam alignment
    3. Beam energy
    4. Timer
    5. mA
    6. Tube head stability
    7. Focal spot size

### **Quality Assurance**

- **Viewing conditions**
  - Viewboxes should be cleaned weekly

### **Infection control**

- Universal precautions should be used because many patients are unaware that they are carriers of infectious disease or choose not to reveal this information.
- The goal is to block the transmission of infectious agents between patients and dental personnel or other patients

### **Infection control**

- Use of these precautions in preparation of the radiographic areas and equipment, conduct of the examination and film processing
- One set of procedures is used for all patients regardless of their presumed status

### **Infection control**

- Preventing cross-contamination in radiographic practice by using surface disinfectants on all surfaces and by using barriers to isolate equipment from direct contact

### **Infection control**

- Infection-control procedures
  - Prepackage x-ray films and sterilize film-holding instruments
  - Disinfect and cover PID, x-ray head and support, working surfaces, chair and apron
  - Expose radiographs
  - Process contaminated x-ray films
  - Remove all barriers and spray or wipe all working surfaces and apron with disinfectant
  - Disinfect panoramic machine and cephalostat

### **Infection control**

- Prepackage x-ray films and sterilize film-holding instruments
  - Dispense them in procedure quantities
  - No one wearing contaminated gloves should retrieve a film from supply

### **Infection control**



### **Infection control**

- Disinfect and cover PID, x-ray head and support, working surfaces, chair and apron
  - Good surface disinfectants include, iodophors, chlorines, and synthetic phenolic cpds
- It should be tuberculocidal and capable of preventing other infectious diseases, including hepatitis B and HIV

### Infection control



### Infection control



### Infection control



### Infection control



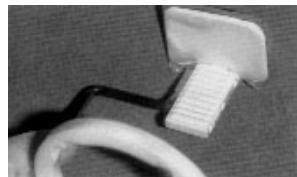
### Infection control

- Expose radiographs
  - Keep charts away during radiographic examination
  - Make chair adjustments in advance
  - Use a towel to wipe each film as you remove it from patient's mouth

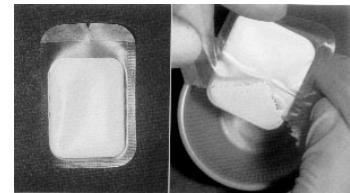
### Infection control

- Process contaminated x-ray films
  - Only clean films are placed into processing solutions
  - Day light loaders offer a problem because of the risk of contaminating the sleeves with contaminated gloves or film packets
  - Immersion of films for 30s in a 5.25% solution of sodium hypochlorite is effective

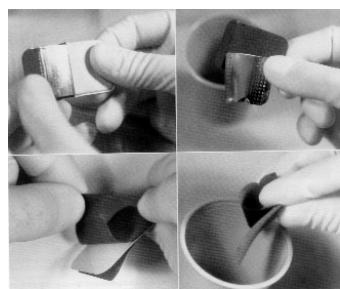
**Infection control**



**Infection control**



**Infection control**



**Infection control**

- Remove all barriers and spray or wipe all working surfaces and apron with disinfectant

**Infection control**

- Disinfect panoramic machine and cephalostat